What is claimed is:

1. A temperature compensated crystal oscillator comprising: a oscillation circuit that has a piezoelectric vibrator having a piezoelectric element which is excited in a predetermined frequency, and an oscillation amplifier that excites the piezoelectric element by flowing a current to the piezoelectric element; a vibrator current controller that controls a current of the piezoelectric vibrator; a temperature compensation circuit that compensates for temperature characteristics of the piezoelectric vibrator; and a variable capacitance diode that changes the oscillation frequency by changing the load capacitance of the oscillation circuit using an external voltage, wherein

the temperature compensation circuit generates a functional voltage that compensates for the temperature characteristics of the piezoelectric vibrator, and inputs the functional voltage to the vibrator current controller, thereby to control the vibrator current to change the oscillation frequency of the oscillation circuit so as to compensate for the temperature characteristics of the piezoelectric vibrator, and the temperature compensation circuit changes an application voltage of the variable capacitance diode using the external voltage, thereby to change the oscillation frequency of the oscillation circuit.

2. A temperature compensated crystal oscillator comprising:

a oscillation circuit that has a piezoelectric vibrator having a piezoelectric element which is excited in a predetermined frequency, and an oscillation amplifier that excites the piezoelectric element by flowing a current to the piezoelectric element; a vibrator current controller that controls a current of the piezoelectric vibrator; a temperature compensation circuit that compensates for temperature characteristics of the piezoelectric vibrator; and a variable capacitance diode that changes the oscillation frequency by changing the load capacitance of the oscillation circuit using an external voltage, wherein

the temperature compensation circuit generates a functional voltage that compensates for the temperature characteristics of the piezoelectric vibrator, and applies the functional voltage to the variable capacitance diode to change the load capacitance of the oscillation circuit, thereby to change the oscillation frequency of the oscillation circuit so as to compensate for the temperature characteristics of the piezoelectric vibrator, and the temperature compensation circuit changes a voltage to be input to the vibrator current controller using the external voltage, thereby to change the oscillation frequency of the oscillation circuit.

3. The temperature compensated crystal oscillator according to claim 1 or 2, wherein

a reactance element that changes the oscillation frequency of the oscillation circuit by changing the load capacitance is

further inserted into the load of the oscillation circuit.

4. The temperature compensated crystal oscillator according to claim 1 or 2, wherein

a variable reactance element that changes the oscillation frequency of the oscillation circuit by changing the load capacitance is further inserted into the load of the oscillation circuit, and the capacitance of the variable reactance element is changed from the outside of the oscillator thereby to control the oscillation frequency of the oscillation circuit.

5. The temperature compensated crystal oscillator according to claim 1, further comprising:

a correction variable capacitance diode that corrects a compensation distortion generated by changing the load capacitance, wherein

the correction variable capacitance diode corrects a compensation distortion generated by changing the load capacitance of the vibrator current controller using a functional voltage that is generated by the temperature compensation circuit.